

WHAT IS CLAIMED IS:

1. An optical recording medium having a plurality of recording layers of a double-spiral structure in which information is recorded on both of land tracks and groove tracks, wherein

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a spiral of a first recording layer of said recording layers is in a forward direction,

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a spiral of a second recording layer of said recording layers is in a backward direction, and

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first information is recorded on one of a land track and a groove track of said first recording layer in the direction from an inner periphery toward an outer periphery of said optical recording medium, and second information subsequent to said first information is recorded on one of a land track and a groove track of said second recording layer in the direction from the outer periphery toward the inner periphery of said optical recording medium.

2. An optical recording medium having a plurality of recording layers of a double-spiral structure in which information is recorded on both of land tracks and groove tracks, wherein

a spiral of a first recording layer of said recording layers is in a forward direction,

a spiral of a second recording layer of said recording layers is in a backward direction, and

first information is recorded on one of a land track and a groove track of said first recording layer in the direction from an outer periphery toward an inner periphery of said optical recording medium, and second information 5 subsequent to said first information is recorded on one of a land track and a groove track of said second recording layer in the direction from the inner periphery toward the outer periphery of said optical recording medium.

10 3. The optical recording medium according to claim 1, wherein third information subsequent to said second information is recorded on one of the land track and the groove track of said first recording layer on which said first information is not recorded, and fourth information 15 subsequent to said third information is recorded on one of the land track and the groove track of said second recording layer on which said second information is not recorded.

20 4. The optical recording medium according to claim 2, wherein third information subsequent to said second information is recorded on one of the land track and the groove track of said first recording layer on which said first information is not recorded, and fourth information 25 subsequent to said third information is recorded on one of the land track and the groove track of said second recording layer on which said second information is not recorded.

5. The optical recording medium according to claim 1, wherein said first information is recorded on the land track of said first recording layer, and said second information is recorded on the land track of said second recording layer.

6. The optical recording medium according to claim 2, wherein said first information is recorded on the land track of said first recording layer, and said second information is recorded on the land track of said second recording layer.

7. The optical recording medium according to claim 1, wherein said first information is recorded on the groove track of said first recording layer, and said second information is recorded on the groove track of said second recording layer.

8. The optical recording medium according to claim 2, wherein said first information is recorded on the groove track of said first recording layer, and said second information is recorded on the groove track of said second recording layer.

25 9. The optical recording medium according to claim 1, wherein either of said first recording layer and said second

recording layer has been divided into N zones (zone 1 to zone N) from the inner periphery toward the outer periphery of said optical recording medium, and

first information is recorded on one of the land track and the groove track in zone n (n: a natural number not less than one and not more than N) of said first recording layer in the direction from the inner periphery toward the outer periphery of said optical recording medium, and second information subsequent to said first information is recorded on one of the land track and the groove track in zone n of said second recording layer in the direction from the outer periphery toward the inner periphery of said optical recording medium.

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15 10. The optical recording medium according to claim 9, wherein an outer periphery end of zone n of said second recording layer is located nearer to the outer periphery of said optical recording medium than an outer periphery end of zone n of said first recording layer.

20 11. The optical recording medium according to claim 2, wherein

either of said first recording layer and said second recording layer has been divided into N zones (zone 1, zone 2, ..., zone N) from the inner periphery toward the outer periphery of said optical recording medium, and

first information is recorded on one of the land

track and the groove track in zone n (n: a natural number not less than one and not more than N) of said first recording layer in the direction from the outer periphery toward the inner periphery of said optical recording medium, and second information subsequent to said first information is recorded on one of the land track and the groove track in zone n of said second recording layer in the direction from the inner periphery toward the outer periphery of said optical recording medium.

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12. The optical recording medium according to claim
11, wherein an inner periphery end of zone n of said second recording layer is located nearer to the inner periphery of said optical recording medium than an inner periphery end of zone n of said first recording layer.

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13. The optical recording medium according to claim
9, wherein said first information is recorded on the land track in zone n of said first recording layer, and said second information is recorded on the land track in zone n of said second recording layer.

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14. The optical recording medium according to claim
11, wherein said first information is recorded on the land track in zone n of said first recording layer, and said second information is recorded on the land track in zone n of said second recording layer.

15. The optical recording medium according to claim
9, wherein said first information is recorded on the groove
track in zone n of said first recording layer, and said
5 second information is recorded on the groove track in zone n
of said second recording layer.

10 16. The optical recording medium according to claim
11, wherein said first information is recorded on the groove
track in zone n of said first recording layer, and said
second information is recorded on the groove track in zone n
15 of said second recording layer.

17. An optical recording medium having a plurality
20 of recording layers of a double-spiral structure in which
information is recorded on both of land tracks and groove
tracks, wherein

25 at least a first recording layer, a second recording
layer, a third recording layer, and a fourth recording layer
are provided as said recording layers,

spirals of said first recording layer and said third
recording layer are in a forward direction,

spirals of said second recording layer and said
fourth recording layer are in a backward direction,

25 a first recording direction from an inner periphery
toward an outer periphery of the optical recording medium and
a second recording direction from the outer periphery toward

the inner periphery of the optical recording medium are defined as the order of recording information,

5 the recording direction of said first recording layer and said third recording layer is one of said first recording direction and said second recording direction,

the recording direction of said second recording layer and said fourth recording layer is the other of said first recording direction and said second recording direction, and

10 physical addresses are allocated in the order of one of a land track and a groove track of said first recording layer, one of a land track and a groove track of said second recording layer, the other of the land track and the groove track of said first recording layer, the other of the land track and the groove track of said second recording layer, one of a land track and a groove track of said third recording layer, one of a land track and a groove track of said fourth recording layer, the other of the land track and the groove track of said third recording layer, and the other 20 of the land track and the groove track of said fourth recording layer.

18. An information recording apparatus for recording information onto an optical recording medium having 25 at least a first recording layer and a second recording layer of a double-spiral structure in which information is recorded on both of land tracks and groove tracks, wherein

10 a spiral of said first recording layer is in a forward direction.

15 a spiral of said second recording layer is in a backward direction,

20 5 a first recording direction from an inner periphery toward an outer periphery of the optical recording medium and a second recording direction from the outer periphery toward the inner periphery of the optical recording medium are defined as the order of recording information,

25 10 information is recorded in said first recording layer in one of said first recording direction and said second recording direction,

30 15 information is recorded in said second recording layer in the other of said first recording direction and said second recording direction, and

35 20 physical addresses for recording are allocated in the order of one of a land track and a groove track of said first recording layer, one of a land track and a groove track of said second recording layer, the other of the land track and the groove track of said first recording layer, and the other of the land track and the groove track of said second recording layer.

40 25 19. An information reproducing apparatus for reproducing information from an optical recording medium having at least a first recording layer and a second recording layer of a double-spiral structure in which

information is recorded on both of land tracks and groove tracks, wherein

a spiral of said first recording layer is in a forward direction,

5 a spiral of said second recording layer is in a backward direction,

10 a first reproducing direction from an inner periphery toward an outer periphery of the optical recording medium and a second reproducing direction from the outer periphery toward the inner periphery of the optical recording medium are defined as the order of reproducing information,

15 information is reproduced from said first recording layer in one of said first reproducing direction and said second reproducing direction,

20 information is reproduced from said second recording layer in the other of said first reproducing direction and said second reproducing direction, and

information is reproduced following physical addresses allocated in the order of one of a land track and a groove track of said first recording layer, one of a land track and a groove track of said second recording layer, the other of the land track and the groove track of said first recording layer, and the other of the land track and the groove track of said second recording layer.

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20. An information reproducing apparatus for reproducing information from an optical recording medium

having at least a first recording layer and a second recording layer of a double-spiral structure in which information is recorded on both of land tracks and groove tracks, wherein

5 a spiral of said first recording layer is in a forward direction,

a spiral of said second recording layer is in a backward direction,

10 information has been recorded in said first recording layer in the direction from an inner periphery toward an outer periphery of said optical recording medium,

information has been recorded in said second recording layer in the direction from the outer periphery toward the inner periphery of said optical recording medium,

15 either of said first recording layer and said second recording layer has been divided into N zones (zone 1 to zone N) from the inner periphery toward the outer periphery of said optical recording medium,

20 first information has been recorded on one of a land track and a groove track in zone n (n: a natural number not less than one and not more than N) of said first recording layer, and second information subsequent to said first information has been recorded on one of a land track and a groove track in zone n of said second recording layer, and

25 a driving device is provided for driving a pickup so that said first information is reproduced following physical addresses, the focus of said pickup is slid by a

predetermined amount in the direction toward the inner periphery of said optical recording medium with a focus jump from said first recording layer to said second recording layer, and then said second information is reproduced
5 following physical addresses.

21. An information reproducing apparatus for reproducing information from an optical recording medium having at least a first recording layer and a second recording layer of a double-spiral structure in which information is recorded on both of land tracks and groove tracks, wherein

a spiral of said first recording layer is in a forward direction,

15 a spiral of said second recording layer is in a backward direction,

information has been recorded in said first recording layer in the direction from an outer periphery toward an inner periphery of said optical recording medium,

20 information has been recorded in said second recording layer in the direction from the inner periphery toward the outer periphery of said optical recording medium,

either of said first recording layer and said second recording layer has been divided into N zones (zone 1 to zone
25 N) from the inner periphery toward the outer periphery of said optical recording medium,

first information has been recorded on one of a land

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track and a groove track in zone n (n: a natural number not less than one and not more than N) of said first recording layer, and second information subsequent to said first information has been recorded on one of a land track and a 5 groove track in zone n of said second recording layer, and

a driving device is provided for driving a pickup so that said first information is reproduced following physical addresses, the focus of said pickup is slid by a predetermined amount in the direction toward the outer periphery of said optical recording medium with a focus jump from said first recording layer to said second recording layer, and then said second information is reproduced following physical addresses.